

Java Programming Lab

Lab 1: Write a simple java application, to print the message, "Welcome to java"

Program:

```
class Lab1{  
    public static void main(String args[])  
    {  
        System.out.println("Welcome to java");  
    }  
}
```

Output:

Welcome to java

Lab 2: Write a program to display the month of a year. Months of the year should be held in an array.

Program:

```
import java.util.Calendar;  
  
class Lab2{  
  
    public static void main(String args[]){  
  
        Calendar calendar=Calendar.getInstance();
```

String

```
mon[]={ "Jan", "Feb", "March", "April", "May", "June", "July", "Aug", "Sept", "Oct", "Nov", "Dec"};
```

```
System.out.println(calendar.get(Calendar.MONTH));
```

```
System.out.println("Current Month="+mon[calendar.get(Calendar.MONTH)]);
```

```
}
```

```
}
```

Output:

5

Current Month=June

Lab 3: Write a program to demonstrate a division by zero exception

Program:

```
class Lab3{
```

```
public static void main (String args[]) {
```

```
int num1 = 15, num2 = 0, result = 0;
```

```
try{
```

```
result = num1/num2;
```

```
System.out.println("The result is" +result);
```

```
}
```

```
catch (ArithmeticException e) {
```

```
System.out.println ("Can't be divided by Zero: "+ e);
```

```
}  
}  
}
```

Output:

Can't be divided by Zero: java.lang.ArithmeticException: / by zero

Lab 4: Write a program to create a user defined exception say Pay Out of Bounds.

Program:

```
import java.util.*;  
  
class PayoutOfBoundsException extends Exception{  
    PayoutOfBoundsException(String msg){  
        System.out.println("Pay out of bound exception:"+msg);  
    }  
}  
  
public class Lab4{  
    public static void main(String args[]) throws PayoutOfBoundsException{  
        System.out.println("Enter the emp salary");  
        Scanner sc=new Scanner(System.in);  
        int pay=sc.nextInt();
```

```
if(pay<10000 || pay>50000){  
    throw new PayoutOfBoundsException("salary not in valid range");  
}else  
    System.out.println("Emp is eiligible for 30% hike");  
}  
}
```

Output 1:

Enter the emp salary

60000

Pay out of bound exception:salary not in valid range

Exception in thread "main" PayoutOfBoundsException

at Lab4.main(Lab4.java:16)

Output 2:

Enter the emp salary

30000

Emp is eiligible for 30% hike

Lab 5: Write a java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.

Program:

```
class Lab5{

static int add(int a, int b){

return a+b;

}

static float add(float x, float y){

return x+y;

}

static int add(){

return (50+50);

}

public static void main(String args[]){

int int_sum=add(10,13);

float flt_sum=add(12.2f,10.0f);

System.out.println("add of int is:"+int_sum);

System.out.println("Add of float is:"+flt_sum);

System.out.println("Calling Default addition");

int deft=add();

System.out.println("Default add:"+deft);
```

```
}
```

```
}
```

Output:

add of int is:23

Add of float is:22.2

Calling Default addition

Default add:100

Lab 6: Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.

Program:

```
class AddSub{  
    int n1,n2;  
    public AddSub(int x, int y)  
    {  
        n1=x;  
        n2=y;  
    }  
}
```

```
    public int add(){
        return(n1+n2);
    }

    public int sub(){
        return(n1-n2);
    }
}

class MulDiv extends AddSub{
    public MulDiv(int x, int y){
        super(x,y);
    }

    public int mul(){
        return(n1*n2);
    }

    public int div(){
        return(n1/n2);
    }
}
```

```
class Lab6{  
    public static void main(String args[]){  
        MulDiv md=new MulDiv(20,10);  
        System.out.println("Sum of (20,10)is:"+md.add());  
        System.out.println("Substraction of (20,10)is:"+md.sub());  
        System.out.println("Multiplication of (20,10)is:"+md.mul());  
        System.out.println("Division of (20,10)is:"+md.div());  
    }  
}
```

Output:

Sum of (20,10)is:30

Substraction of (20,10)is:10

Multiplication of (20,10)is:200

Division of (20,10)is:2

Lab 7: Write a program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.

Program:


```
class Student{
    static String collegeName="KLE";
    int rno;
    String sname;

    public Student(int no, String nm){
        rno=no;
        sname=nm;
    }

    void display(){
        System.out.println(collegeName+" "+rno+" "+sname);
    }
}
```

```
public class Lab7{
    public static void main(String args[]){
        System.out.println("Objects sharing the static variable collegename");
        Student s1=new Student(1,"Sri");
        Student s2=new Student(2,"Ram");
        s1.display();
        s2.display();
    }
}
```

```
System.out.println("Static value is changed by one of the object");  
  
    s1.collegeName="KLESNC";  
  
    s1.display();  
  
    s2.display();  
  
}  
  
}
```

Output:

Objects sharing the static variable collegename

KLE 1 Sri

KLE 2 Ram

Static value is changed by one of the object

KLESNC 1 Sri

KLESNC 2 Ram

Lab 8: Write a java program to create a student class with following attributes: Enrollment id: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying

student details. In the main method create an array of three student objects and display the details.

Program:

```
import java.util.*;

class Student{

Scanner sc=new Scanner(System.in);

String Eid;

String name;

int sub1, sub2,sub3, total;

Student(){

getInfo();

}

public void getInfo(){

System.out.println("**Student details**");

System.out.println("Enter Enrollment ID");

Eid=sc.next();

System.out.println("Enter Name");
```

```
name=sc.next();
System.out.println("Enter marks");
sub1=sc.nextInt();
sub2=sc.nextInt();
sub3=sc.nextInt();

if(sub1 >=50 && sub2 >=50 && sub3 >=50){
total=sub1+sub2+sub3;}
else{
total=0;
}
}

public void display(){
System.out.println(Eid+"\t\t"+name+"\t\t"+total);
}
}

class Lab8{
public static void main(String args[]){
Student s[]=new Student[3];
```

```
for(int i=0;i<3;i++){  
s[i]=new Student();  
}
```

```
System.out.println("***Student Details***");  
System.out.println("Eid"+"\\t\\t"+"name"+"\\t\\t"+"total");  
for( int i=0;i<3;i++){  
s[i].display();  
}  
}  
}
```

Output:

Enter Enrollment ID

s1

Enter Name

sri

Enter marks

66

67

68

***Student details**

Enter Enrollment ID

s2

Enter Name

ram

Enter marks

78

87

67

****Student details****

Enter Enrollment ID

s3

Enter Name

hari

Enter marks

98

78

65

*****Student Details*****

Eid	name	total
s1	sri	201
s2	ram	232
s3	hari	241

Lab 9: In a college first year class are having the following attributesName of the class (BCA, BCom, BSc), Name of the staff , No of the students in the class, Array of students in the class

Program:

```
import java.util.*;

class FirstYear{

String classname;

String classteacher;

int stdcount;

int stdmarks[]= new int[50];

String stdnames[] = new String[50];

Scanner sc = new Scanner(System.in);

public FirstYear() {

getinfo();

}

public void getinfo() {

System.out.println("Please Enter the class Name:");
```

```
classname = sc.nextLine();

System.out.println("Please Enter the class Teacher Name:");

classteacher = sc.nextLine();

System.out.println("Please Enter the Total number of students of the
class:");

stdcount = Integer.parseInt(sc.nextLine());

System.out.println("Please Enter the Names of all the students of the
class:");

for(int i=0;i<stdcount;i++)

stdnames[i]=sc.nextLine();

System.out.println("Please Enter the marks of all the students of the
class:");

for(int i=0;i<stdcount;i++)

stdmarks[i]=sc.nextInt();

}

public void bestStudent(){

int best=0, k=-1;

for(int i=0;i<stdcount;i++) {

if(stdmarks[i] > best) {

best = stdmarks[i];

k=i;

}
```



```
}  
}  
System.out.println("The Best Student is "+stdnames[k]);  
}  
}  
public class Lab9{  
    public static void main(String args[]){  
        FirstYear fy = new FirstYear();  
        fy.bestStudent();  
    }  
}
```

Output:

Harshada

Please Enter the Total number of students of the class:

3

Please Enter the Names of all the students of the class:

A

B

C

Please Enter the marks of all the students of the class:

78

87

The Best Student is C

Lab 10: Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class

Program:

Lab 11:

Write a Java program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.

Program:

```
import java.util.Date;

class Employee {

    String name;

    Date appdate;

    public Employee(String nm, Date apdt){

        name=nm;

        appdate=apdt;

    }

}
```



```

for(int i=0;i<emp.length;i++){
    for(int j=i+1;j<emp.length;j++){
        if(emp[i].appdate.after(emp[j].appdate)){
            Employee t= emp[i];
            emp[i]=emp[j];
            emp[j]=t;
        }
    }
}

System.out.println("\nList of employees seniority wise");

for(int i=0;i<emp.length;i++)
    emp[i].display();
}
}

```

Output:

list of employees Before sorting

employee name:Neeraja k appointment date: 22/5/1999

employee name:roja D appointment date: 25/4/2009

employee name:rana k appointment date: 19/2/2005

employee name:jothika appointment date: 1/1/2009

employee name:srikanth appointment date: 1/1/1999

employee name:rajesh appointment date: 19/5/2020
employee name:asha appointment date: 25/1/2000
employee name:ammu appointment date: 22/4/2022
employee name:gourav appointment date: 9/9/2002
employee name:kuldeep appointment date: 19/1/2000

List of employees seniority wise

employee name:srikanth appointment date: 1/1/1999
employee name:Neeraja k appointment date: 22/5/1999
employee name:kuldeep appointment date: 19/1/2000
employee name:asha appointment date: 25/1/2000
employee name:gourav appointment date: 9/9/2002
employee name:rana k appointment date: 19/2/2005
employee name:jothika appointment date: 1/1/2009
employee name:roja D appointment date: 25/4/2009
employee name:rajesh appointment date: 19/5/2020
employee name:ammu appointment date: 22/4/2022

Lab 12:

Create a package 'student.Fulltime.BCA' in your current working directory
a. Create a default class student in the above package with the following
attributes: Name, age, sex. b. Have methods for storing as well as displaying

Program:

package student.fulltime.bca;

```
import java.util.Scanner;

public class BCASStudent{

String name, sex;

int age;

Scanner sc=new Scanner(System.in);

public void getdata(){

System.out.println("Student Name:");

name=sc.nextLine();

System.out.println("Student Sex:");

sex=sc.nextLine();

System.out.println("Student Age:");

age=sc.nextInt();

}

public void display(){

System.out.println("Student details are:");

System.out.println("Student Name:"+name);

System.out.println("Student Sex:"+sex);

System.out.println("Student Age:"+age);

}

}
```

/* NOTE: Save this file by name BCASStudent.java

Compile this file by using command:

```
javac -d . BCASStudent.java
```

folder hierarchy Student\fulltime\bca will be created and BCASStudent is placed in bca folder

```
*/
```

```
//save this file as packageDemo.java outside of student folder and execute this file
```

```
import student.fulltime.bca.BCASStudent;
```

```
public class packageDemo{  
    public static void main(String args[]){  
        BCASStudent std=new BCASStudent();  
        std.getdata();  
        std.display();  
    }  
}
```

Output:

Student Name:

sri

Student Sex:

male

Student Age:

23

Student details are:

Student Name:sri

Student Sex:male

Student Age:23

Lab 13:

Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.

Program:

```
import java.util.*;

class Lab13

{

    public static void main(String args[])

    {

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the size of an array: ");

        int size=sc.nextInt();

        try

        {

            String[] s=new String[size];

            System.out.println("Array is created successfully");

        }

        catch(NegativeArraySizeException e)
```



```

    {
        System.out.println("Array underflow");
        System.out.println(e.toString());
    }

}
}

```

Output:

Enter the size of an array:

-2

Array underflow

java.lang.NegativeArraySizeException

Lab 14:

Write a program to handle Null Pointer Exception and use the “finally” method to display a message to the user.

Program:

```

class Lab14{
public static void main(String args[]){

String city=null;
try{
    if(city.equals("Bangalore"))
        System.out.println("Equals");
    else
        System.out.println("not Equals");
}
}
}

```

```

    } catch(NullPointerException e){
        System.out.println("Null Pointer Exception Caught");
    }
    finally{
        System.out.println(" this is finally block after try_catch blk");
    }
}
}

```

Output:

Null Pointer Exception Caught

this is finally block after try catch blk

Lab 15:

Write a program which create and displays a message on the window

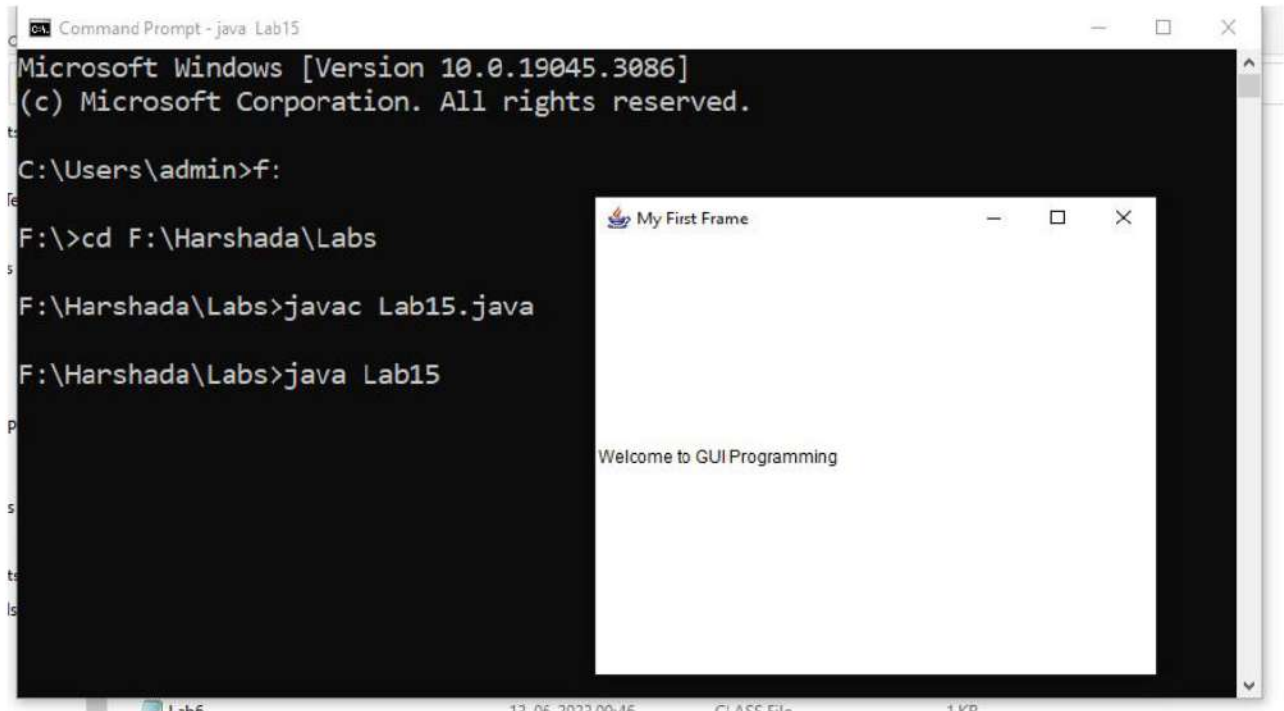
Program:

```

import java.awt.*;
public class FrameDemo{
    FrameDemo(){
        Frame fm = new Frame();
        fm.setTitle("My First Frame");
        Label lb = new Label("Welcome to GUI Programming");
        fm.add(lb);
        fm.setSize(300,300);
        fm.setVisible(true);
    }
    public static void main(String args[]){
        FrameDemo ta = new FrameDemo();
    }
}

```

Output:



Lab 16:

Write a program to draw several shapes in the created window

Program:

```
import java.awt.*;  
  
public class Drawings extends Canvas  
{  
    public void paint(Graphics g)  
    {  
        g.drawRect(50,75,100,50);  
        g.fillRect(200,75,50,50);  
        g.drawRoundRect(50,150,100,50,15,15);  
        g.fillRoundRect(175,150,100,50,15,15);  
        g.drawOval(50,275,100,50);  
        g.fillOval(175,275,100,50);  
        g.drawArc(20,350,100,50,25,75);  
    }  
}
```

```

        g.fillArc(175,350,100,50,25,75);
    }

    public static void main(String args[])
    {
        Drawings m = new Drawings();
        Frame f = new Frame("Shapes");
        f.add(m);
        f.setSize(400,450);
        f.setVisible(true);
    }
}

```

Output:



Lab 17:

Write a program to create an applet and draw grid lines

Program:

```

import java.awt.*;
import java.applet.*;

```

```
/*<applet code=Lab17 width=200 height=200>  
</applet>*/
```

```
public class Lab17 extends Applet{  
    public void paint(Graphics g){  
        int row, column,x,y=20;  
        for(row=1;row<5;row++){  
            x=20;  
            for(column=1;column<5;column++){  
                g.drawRect(x,y,40,40);  
                x=x+20;  
            }  
            y=y+20;  
        }  
    }  
}
```

Output:



```
Command Prompt - appletviewer Lab17.java  
F:\Harshada\Labs>appletviewer Lab17.java  
F:\Harshada\Labs>javac Lab17.java  
F:\Harshada\Labs>appletviewer Lab17.java
```

Lab Cycle: 18

Write a program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.

```
import java.awt.*;
import java.awt.event.*;

public class Lab18
{
    public static void main(String args[])
    {
        Frame f = new Frame("Button Event");
        Label l = new Label("Details of Parents");
        l.setFont(new Font("Calibri", Font.BOLD, 16));
        final Label n1 = new Label();
        final Label d1 = new Label();
        final Label a1 = new Label();
        l.setBounds(20,20,500,50);
        n1.setBounds(20,110,500,30);
        d1.setBounds(20,150,500,30);
        a1.setBounds(20,190,500,30);
        Button mb = new Button("Mother");
        mb.setBounds(20,70,50,30);

        mb.addActionListener(new ActionListener()
        {
            public void actionPerformed(ActionEvent e)
            {
                n1.setText("Name: "+"Aishwarya");
                a1.setText("Age: "+"42");
                d1.setText("Designation: "+"Professor");
            }
        })
    }
}
```

```

});

Button fb = new Button("Father");
fb.setBounds(80,70,50,30);

fb.addActionListener(new ActionListener()
{
    public void actionPerformed(ActionEvent e)
    {
        n1.setText("Name: "+"Ram");
        a1.setText("Age: "+"45");
        d1.setText("Designation: "+"Manager");
    }
});

f.add(mb);
f.add(fb);
f.add(l);
f.add(n1);
f.add(d1);
f.add(a1);
f.setLayout(null);
f.setSize(250,250);
f.setVisible(true);
}
}

```

Output:



Lab 19: Create a frame which displays your personal details with respect to a button click .

```
import java.awt.*;
import java.awt.event.*;

class personalDetails
{
    public static void main(String args[])
    {
        Frame f= new Frame("Button example");
        Label lb=new Label("Welcome to my page");
        lb.setFont(new Font("Calibri", Font.BOLD,14));

        final Label fnl=new Label();
        final Label mnl=new Label();
        final Label lnl=new Label();
        final Label rnl=new Label();
        final Label anl=new Label();
        lb.setBounds(250,30,600,50);
        fnl.setBounds(20,120,600,30);
        mnl.setBounds(20,160,600,30);
        lnl.setBounds(20,200,600,30);
        rnl.setBounds(20,240,600,30);
        anl.setBounds(20,280,600,30);
        Button mb=new Button("Click here for my personal info");
        mb.setFont(new Font("Calibri", Font.BOLD,14));
        mb.setBounds(210,70,320,30);

        mb.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e){
                fnl.setText("Full Name: Aishwarya Rao");
            }
        });
    }
}
```



```

        mnl.setText("Father name:Ranjith Mother name: vijaya");
        ln1.setText("Roll no: BNU85765 College name: KLE");
        rl.setText("Nationality: Indian Contact no: 11111111");
        al.setText("Address: Rajajinagar, Bangalore");
    }
});

```

```

f.add(mb);
f.add(lb);
f.add(fnl);
f.add(mnl);
f.add(ln1);
f.add(rl);
f.add(al);

```

```

f.setSize(400,400);
f.setLayout(null);
f.setVisible(true);
}

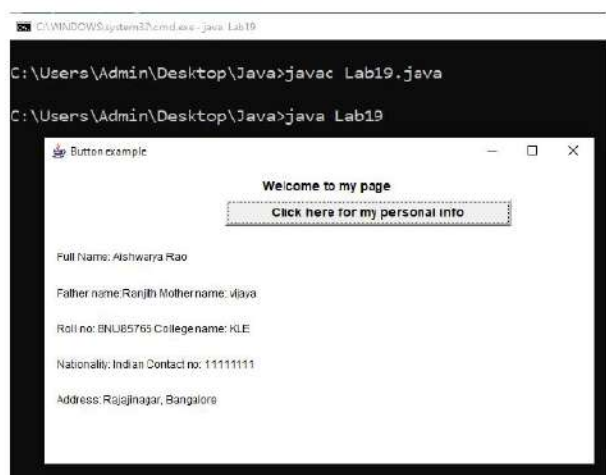
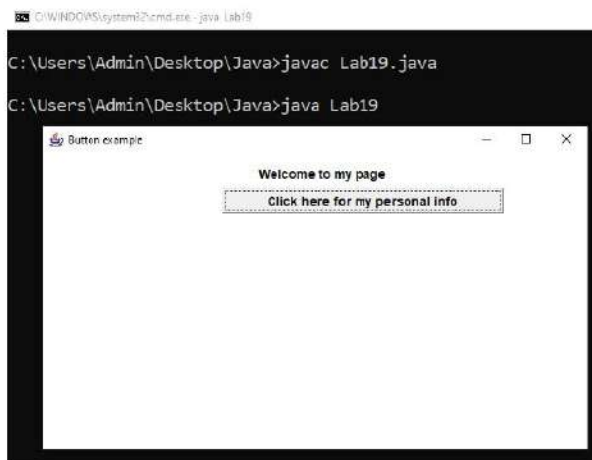
```

```

}

```

Output:



/*Lab 20: Create a simple applet which reveals the personal information of yours.

***/**

```
import java.awt.*;
import java.applet.*;
import java.awt.event.*;
```

```
public class Lab20 extends Applet implements ActionListener{
String s1="";
String s2="";
String s3="";
String s4="";
String s5="";
```

```
public void init(){
    setLayout(null);
    setSize(400,300);
    Button btn=new Button("Click here for my personal details");
    add(btn);
    btn.setBounds(20,50,300,30);
    btn.addActionListener(this);
}
```

```
public void actionPerformed(ActionEvent e){
    s1="Full Name: Aishwarya Rao";
    s2="Father Name: Ranjith Mother Name: Vijaya Age:19";
    s3="Roll No: BNU234324 College name: KLE";
    s4="Nationality: Indian Contact No:123456789";
    s5="Address: Rajajinagar, Bangalore";

    repaint();
}
```

```
public void paint(Graphics g){
    g.setFont(new Font("TimesRoman",Font.BOLD,14));
    g.drawString(s1,20,110);
    g.drawString(s2,20,140);
    g.drawString(s3,20,180);
```

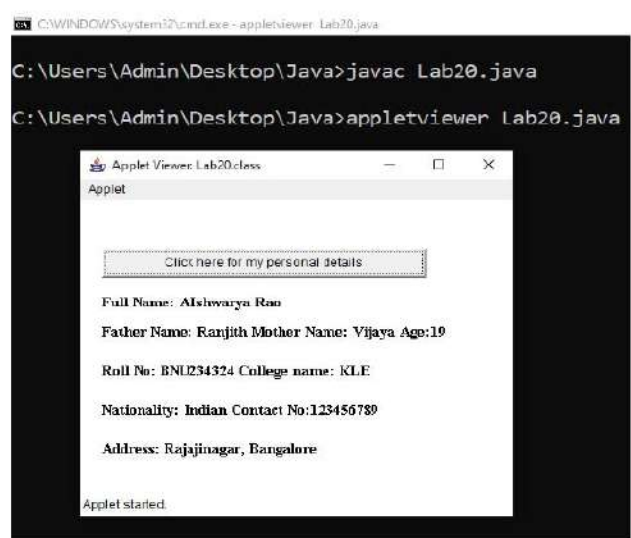
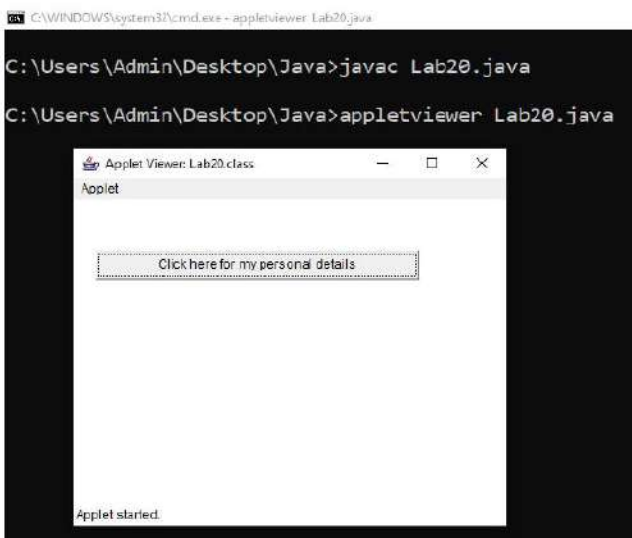
```

        g.drawString(s4,20,220);
        g.drawString(s5,20,260);
    }
}

/* <applet code="Lab20.class" height=400 width=400></applet>
*/

```

Output:



Lab 22: Write a java Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night

Program:

```

import java.awt.*;
import java.awt.event.*;

```

```

public class Lab22 extends Frame implements KeyListener{
Label lbl;
Label l;

Lab22(){
    l = new Label("Press the key [ M, A, E, N ] to Display Greetings", Label.CENTER);
    l.setBounds(50, 50, 300, 50);
    add(l);
        addKeyListener(this);
        requestFocus();
        lbl=new Label();
        lbl.setBounds(100,100,200,40);
        lbl.setFont(new Font("Calibri",Font.BOLD,16));
        add(lbl);
        setSize(400,400);
        setLayout(null);
        setVisible(true);
}

public void keyPressed(KeyEvent e){
    if(e.getKeyChar()=='M' || e.getKeyChar()=='m')
        lbl.setText("Good Morning");
}
}

```

```
        else if(e.getKeyChar()== 'A' || e.getKeyChar()=='a')
            lbl.setText("Good Afternoon");
        else if(e.getKeyChar()== 'E' || e.getKeyChar()=='e')
            lbl.setText("Good Evening");
        else if (e.getKeyChar()== 'N' || e.getKeyChar()=='n')
            lbl.setText("Good Night");
    }

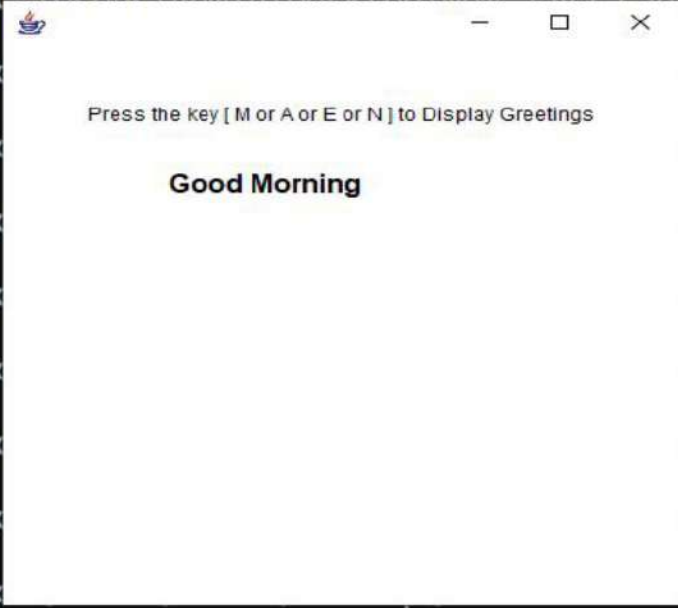
    public void keyReleased(KeyEvent e){
    }

    public void keyTyped(KeyEvent e){
    }

    public static void main(String args[]){
        new Lab22();
    }
}
```

OUTPUT:

```
C:\Users\Admin\Desktop\New Java Lab>javac Lab22.java
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>javac Lab22.java
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>javac Lab22.java
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>javac Lab22.java
C:\Users\Admin\Desktop\New Java Lab>java Lab22
C:\Users\Admin\Desktop\New Java Lab>javac Lab22.java
C:\Users\Admin\Desktop\New Java Lab>java Lab22
```



The screenshot shows a Java Swing window with a white background and a standard Windows title bar. The window contains the text "Press the key [M or A or E or N] to Display Greetings" at the top and "Good Morning" in a larger, bold font in the center. The window is overlaid on a black terminal window showing the execution of a Java program.

Lab 23: Demonstrate the various mouse handling events using suitable example.

Program:

```
import java.awt.*;
import java.awt.event.*;

public class Lab23 extends Frame implements MouseListener{

    Label l;

    Lab23(){

        addMouseListener(this);

        l=new Label();

        l.setBounds(20,50,100,20);
```

```
    add(l);

    setSize(300,300);

    setLayout(null);

    setVisible(true);

}

public void mouseClicked(MouseEvent e) {

    l.setText("Mouse Clicked");

}

public void mouseEntered(MouseEvent e) {

    l.setText("Mouse Entered");

}

public void mouseExited(MouseEvent e) {

    l.setText("Mouse Exited");

}

public void mousePressed(MouseEvent e) {

    l.setText("Mouse Pressed");

}

public void mouseReleased(MouseEvent e) {

    l.setText("Mouse Released");

}

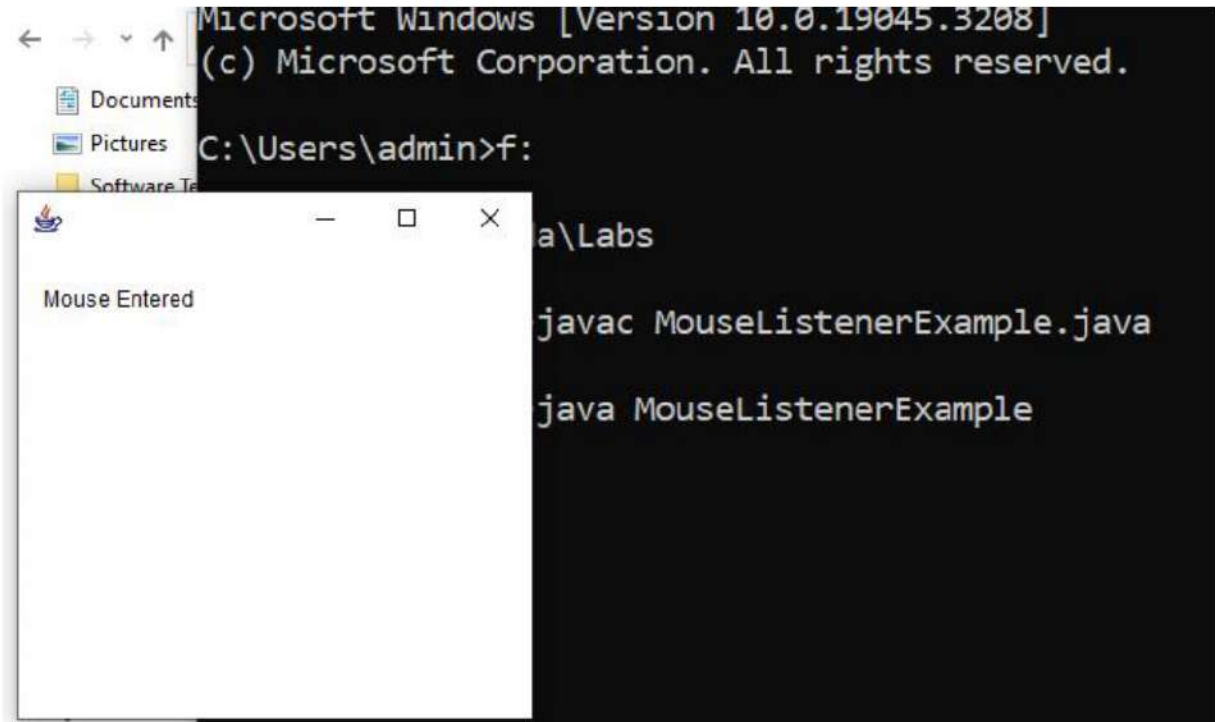
public static void main(String[] args) {

    new Lab23();

}

}
```

OUTPUT:



Lab 24: Write a program to create menu bar and pull-down menus

Program:

```
import java.awt.*;
```

```
class Lab24
```

```
{
```